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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/639,599

08/16/2000

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TOB/102/US

2976

2543 7590 01/31/2008

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EXAMINER

OMGBA, ESSAMA

ART UNIT

PAPER NUMBER

3726

MAIL DATE

DELIVERY MODE

01/31/2008

PAPER

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ALEX S. TOBACK

Appeal 2007-4199
Application 09/639,599
Technology Center 3700

Decided: January 31, 2008

Before WILLIAM F. PATE, III, MURRIEL E. CRAWFORD, and
BIBHU R. MOHANTY, *Administrative Patent Judges*.

CRAWFORD, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134 (2002) from a final rejection of claims 1 to 24. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

Appellant invented a connection system for light-gauge steel construction (Specification 1).

Claim 1 under appeal reads as follows:

1. A connection system for connecting at least one light-gauge steel panel to a support structure comprising:
applying an adhesive to at least one of said panel or support structure, said adhesive being curable at room temperature and able to adhere to steel;
placing said panel against said support structure;
driving at least one fastener through the panel into said support structure;
and
allowing said adhesive to cure,
so that said panel is joined to said structure in a connection which is significantly enhanced in load-bearing capacity to a connection provided only by the at least one fastener.

The Examiner rejected claims 1 to 24 under 35 U.S.C. § 103 as being unpatentable over AAPA on pages 1 and 3 of the Specification in view of Orowan.

The Examiner rejected claims 4 to 7, 8 to 15, 18, 21, and 24 under 35 U.S.C. § 103 as being unpatentable over AAPA on pages 1 and 3 of the Specification and Orowan and further in view of Good.¹

¹ Independent claims 1, 8, and 16, from which claims 2 to 7, 9 to 15, 17, and 18 depend, recite both an apparatus and method steps for forming the apparatus. We note that a single claim to both method and apparatus is indefinite under 35 U.S.C. § 112, second paragraph, *IPXL Holdings, L.L.C. v Amazon.Com, Inc.*, 430 F.3d 1377, 1384 (Fed. Cir. 2005). The statutory class of invention is important in determining patentability and infringement. *See In re Kuehl*, 475 F.2d 658, 665 (CCPA 1973); *Rubber Co. v. Goodyear*, 76 U.S. 788, 796 (1870). As a result of the combination of two separate statutory classes of invention, a manufacturer or seller of the claimed apparatus would not know from the claim whether it might also be liable for

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Orowan	3,655,424	Apr. 11, 1972
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Good	4,426,425	Jan. 17, 1984
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Applicant's Admitted Prior Art (AAPA), pages 1 and 3 of the Specification.

Appellant contends that Orowan does not disclose an adhesive between a panel and a support structure which significantly enhances the load-bearing capacity of the connection between the panel and the support structure provided by at least one fastener alone.

Appellant contends that there is no reason to combine the teachings of the AAPA and Orowan because Orowan and the present invention relate to different problems.

Appellant further contends that the obviousness determination is in error because the present invention uses an adhesive in connection with light gauge steel and because Orowan discloses adhesive tape which the Appellant found does not provide sufficient adhesive load-bearing capacity.

contributory infringement because a buyer or user of the apparatus later performs the claimed method of using the apparatus. Thus, such a claim is not sufficiently precise to provide competitors with an accurate determination of the 'metes and bounds' of protection involved and is ambiguous and properly rejected under section 112, paragraph 2. Upon any further prosecution before the Examiner, the Examiner should consider whether the subject matter of the above-referenced claims is unpatentable under 35 U.S.C. § 112, second paragraph.

Appellant further contends that the prior art does not disclose an epoxy system.

ISSUES

The first issue is whether the Appellant has shown that the Examiner erred in finding that Orowan discloses an adhesive between a panel and a support structure which significantly enhances the load-bearing capacity of the connection between the panel and the support structure provided by at least one fastener alone.

The second issue is whether the Appellant has shown that the Examiner erred in holding that there is a reason to combine the teachings of the AAPA and Orowan and that therefore the combination is improper.

The third issue is whether the Appellant has shown that the Examiner erred in the obviousness determination because Orowan discloses adhesive tape which the Appellant found does not provide sufficient adhesive load-bearing capacity and because Orowan does not relate to light gauge steel construction.

The fourth issue is whether the Appellant has shown that the Examiner erred in finding that Good teaches a two-part epoxy system.

FINDINGS OF FACT

Appellant's Specification discloses a light gauge steel connection which has an enhanced load bearing capacity achieved by the use of both fasteners and structural adhesive (Specification 1). The use of the structural adhesive allows one to significantly increase the load bearing capacity and durability of the connection (Specification 1). As depicted in Figures 2 and 3, the joint integrity was increased when the adhesive was used, as depicted in Figure 3 compared to the fasteners alone as depicted in Figure 2. The specification states that this increase in joint integrity is significant (Specification 3). For example, when using one screw the failure point was 847 pounds versus 3158 points when the adhesive was used as well as the screw. Appellant discloses that the adhesive is selected so as to have a high shear and peel strength and is tough and does not fail adhesively under loads and is capable of adhering to as-received galvanized steel (Specification 3).

Appellant discloses that it was known to use self-drilling screws or fasteners to provide a connection between a steel gauge panel and support structure (Specification 1). Appellant also discloses that Formulation No. 12059A is a known adhesive which is a two-part epoxy system which is fully cured at room temperature in 72 hours (Specification 3).

Orowan discloses that it was known to use adhesive along with fasteners to bond metallic parts. Orowan discloses that in a joint produced by hot riveting, the relative movement between the metallic parts is prevented up to the load at which the fasteners suffer shear fracture and that if the joint is produced by cold riveting, friction between the parts produces

fretting at the abutting surfaces. Orowan discloses that in the prior art adhesive was used to relieve the load on the fasteners to a relatively small extent and to give some protection against fretting (col. 1, ll. 16 to 30). Orowan discloses that the object of the therein disclosed invention is to provide an adhesive for joining structural parts in which the adhesive layer varies from a very small interior thickness to provide high rigidity to a greater thickness near the margins of the adhesive layer to allow gradual increase of the shear stress transmitted by the layer from its margins inward. Orowan discloses that the adhesive relieves the fastening devices of a greater part of the load to which they would otherwise be exposed without the adhesive (col. 1, ll. 58 to 60). This relief of load on the fastening devices is significant because it reduces the displacement that the joint would suffer if the adhesive were not used (col. 1, ll. 54 to 57).

Alex S. Tobak, the present inventor, filed a declaration. The Tobak declaration states that one of ordinary skill in the art would not have turned to the Orowan references because the Orowan reference deals with the problem of fretting between parts joined (paragraph 9). According to Tobak, fretting is not a problem in the light gauge steel construction (paragraph 9). Tobak also states that the solution Orowan proposes is expensive and complex and would not be suitable for light gauge steel applications and that the provision of adhesive in the Orowan environment does not result in a fastening system where the assembly is substantially enhanced in the load-bearing capacity compared with mechanical fasteners alone (paragraph 9).

Good teaches that two part epoxy systems were known in the art at the time of the invention and that these two part epoxy resin system are particularly suitable for metal to metal bonding (col. 1, ll. 7 to 22; col. 2, ll. 26 to 35). Good also teaches that the amount of hardener to be used depends on the resin, the cured rate desired, curing conditions and other factors and that one of ordinary skill in the art would know the most effective amount of hardner for any particular resin system (col. 3, ll. 8 to 20).

ANALYSIS

We are not persuaded by Appellant's argument that the use of the adhesive in Orowan relieves the load on the rivets to only a small extent, because the discussion referenced by the Appellant in Orowan relates to the prior art. The Orowan invention uses adhesive to significantly relieve the load of the fastening device such that displacement that the joint would suffer is reduced. We note that the specification does not specifically define what enhancement of load-bearing capacity is considered significant. Therefore, we give this term in the claim the broadest reasonable construction. When this language is given the broadest reasonable construction, Orowan clearly discloses that the adhesive therein disclosed significantly enhances the load-bearing capacity of the rivets because when the adhesive is used displacements of the joint is reduced.

We are not persuaded by the Appellant's argument that the combination of the AAPA and Orowan is improper because Orowan is from a different technological field i.e., is not analogous art and because the Orowan disclosure is directed to a different problem.

The analogous-art test requires that the Board show that a reference is either in the field of the Applicant's endeavor or is reasonably pertinent to the problem with which the inventor was concerned in order to rely on that reference as a basis for rejection. In re Oetiker, 977 F.2d 1443, 1447 (Fed. Cir. 1992). References are selected as being reasonably pertinent to the problem based on the judgment of a person having ordinary skill in the art. *Id.* (“[I]t is necessary to consider ‘the reality of the circumstances,’ - in other words, common sense - in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor.” (quoting In re Wood, 599 F.2d 1032, 1036 (C.C.P.A. 1979))). Kahn, 441 F.3d at 986-87. See also In re Clay, 966 F.2d 656, 659, (Fed. Cir. 1992) (“[a] reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem.”).

In view of the holding in *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1742 (2007) that “any need or problem known in the field of endeavor at the time of invention and addressed by the patent can provide a reason for combining the elements in the manner claimed,” it is clear that the second part of the analogous-art test as stated in *Clay, supra*, must be expanded to require a determination of whether the reference, even though it may be in a different field from that of the inventor's endeavor, is one which, because of the matter with which it deals, logically would have commended itself to an

artisan's (not necessarily the inventor's) attention in considering *any* need or problem known in the field of endeavor.

In the instant case, Orowan relates to the field of joining metallic parts. The Appellant's field of endeavor is the field of joining light gauge steel parts which are metallic parts, and therefore Orowan is within the field of Appellant's endeavor.

In addition, the Appellant's problem is to increase the load bearing capacity and durability of the connection between the metallic parts. The Appellant solves the problem by using adhesive in addition to fasteners. Orowan likewise is concerned with enhancing the load bearing capacity of the connection between metallic parts. Orowan solves the problem using adhesive in addition to fasteners. As such, Orowan is also pertinent to the problem addressed by the Appellant.

Even if we agreed with the Appellant that Orowan is not pertinent to Appellant's problem because Orowan does not disclose the use of adhesive with light gauge steel used in construction specifically, the use of adhesive in connection with metallic parts logically would have commended itself to an artisan's attention in considering the need to connect light gauge steel used in construction.

Appellant argues that their invention was directed to the problem of high labor and other costs and that the problem was solved by using adhesive so that the number of fasteners could be reduced. This argument is not persuasive because it is not commensurate with the recitations in claim

1, in that claim 1 does not recite that the number of fasteners is reduced. In view of the foregoing, we hold that Orowan is analogous art.

We are not persuaded by Appellant's argument that there is no reason to combine the teachings of the AAPA and Orowan, because AAPA does not teach that there is any need for additional fastening means. Orowan teaches that the use of adhesive would relieve the load on the fasteners which reduces displacement and thereby provides the motivation to modify the AAPA system so as to include adhesive. While Orowan does not discuss the specific advantage discovered by the Appellant i.e., reduction of the failure of the steel components, one cannot obtain patent protection merely by discovering another advantage of doing what is taught by the prior art. *In re Dillon*, 919 F.2d 688, 693 (Fed. Cir. 1990); *In re Lintner*, 458 F.2d 1013, 1016 (CCPA 1972).

We are also not persuaded by the Appellant's argument that the Examiner's obviousness determination is in error because Orowan discloses the use of adhesive tape which the Appellant has found not to work with light gauge steel construction, because this argument is not commensurate with claim 1 which does not recite that the adhesive is not adhesive tape. Therefore, claim 1 is broad enough to include adhesive tape as taught by Orowan.

In view of the foregoing, we will sustain the Examiner's rejection of claim 1 under 35 U.S.C. § 103 as being unpatentable over AAPA in view of Orowan. We will also sustain this rejection as it is directed to claims 2 to 24

because the Appellant has not advanced separate arguments regarding the patentability of these claims in response to this rejection.

We turn next to the Examiner's rejection of claims 4 to 15, 18 to 21, and 24 under 35 U.S.C. § 103 as being unpatentable over AAPA and Orowan and further in view of Good.

We are not persuaded by Appellant's argument that the prior art does not disclose a two-part epoxy system with an equal portion by weight of resin and hardener. The Specification at page 3 and Good at col. 1, ll. 7 to 22, teach that two-part epoxy systems were known in the art at the time of the invention, and Good at col. 2, ll. 26 to 35 teaches that these two-part epoxy resin system are particularly suitable for metal to metal bonding. As we found above, Good also teaches that the amount of hardener to be used depends on the resin, the cured rate desired, curing conditions and other factors, and that one of ordinary skill in the art would know the most effective amount of hardner for any particular resin system. As such in our view, the ratio of resin to hardner is a result effective variable. We note that discovery of an optimum value of a result effective variable (in this case, the optimum) is ordinarily within the skill of the art. *See In re Boesch*, 617 F.2d 272, 276 (CCPA 1980) and *In re Aller*, 220 F.2d 454, 456 (CCPA 1955). As stated in *In re Huang*, 100 F.3d 135, 139 (Fed. Cir. 1996):

This court and its predecessors have long held, however, that even though applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within the capabilities of one

skilled in the art, unless the claimed ranges
"produce a new and unexpected result which is
different in kind and not merely in degree from the
results of the prior art."

Additionally, as stated in *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990):

The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . These cases have consistently held that in such a situation, the applicant must show that the particular range is *critical*, generally by showing that the claimed range achieves unexpected results relative to the prior art range [citations omitted].

In the present case, the Appellant has not even alleged, much less established, that the claimed ratio produces unexpected results. Therefore, we are of the opinion that it would have been obvious to one of ordinary skill in the art at the time of Appellant's invention to have discovered the optimum ratio of resin to hardener. Accordingly, the Examiner's rejection of claim 4 and 5 under 35 U.S.C. ' 103 as being unpatentable over AAPA, Orowan and AAPA is sustained. We will also sustain the Examiner's rejection of claims 6, 7, and 8 to 15 because the Appellant has not argued the separate patentability of these claims.

The decision of the Examiner is affirmed.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2006).

AFFIRMED

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